

REMARKS

This Amendment is submitted under 37 C.F.R. § 1.111 in response to the second non-final Office Action dated June 30, 2004, wherein all of the pending claims, *i.e.*, claims 1 – 9 and 47 were rejected under 35 U.S.C. § 103(a) as being obvious over U.S. Pat. No. 5,909,524 to Tabuchi. Claims 10 – 46 were previously canceled after being withdrawn in response to a Restriction Requirement. In this Amendment applicants have made a minor amendment to claim 47 to correct the wording, and traverse the rejection of claims 1 – 9 and 47 for the reasons discussed below. Claims 1 – 9 and 47 are pending. Reexamination and reconsideration of the application are respectfully requested.

Traversal of Rejection

All of the pending claims of the present application were rejected on the sole ground that they are obvious in view of the Tabuchi patent. Applicants respectfully traverse this rejection. Tabuchi is primarily directed to an invention for facilitating optical alignment of various types of optical structures, including lasers, photodetectors, surface-mounted lenses, optical fibers, and branching structures. Tabuchi does not disclose *any* structures for optical switching, does not show or suggest the use of opto-electrical materials, and does not show or suggest the use of deflector electrodes. Specifically, because the Tabuchi patent is so lengthy, a word search was conducted of the published USPTO electronic version of the patent, confirming that the patent does not contain any discussion of switching, electro-optical (“EO”) materials, opto-electric materials (another name for EO materials), or deflector electrodes. Tabuchi is concerned with techniques for aligning separately fabricated optical devices, such as lasers and fibers. In contrast the optical switches of the present invention are fabricated as a unit and the structures that are formed, *i.e.*, the lenses, the waveguides, the deflectors, etc, are aligned in the manufacturing process. It is respectfully submitted that there is nothing in Tabuchi which makes obvious any of the claims of the present invention.

Independent claim 1 requires the steps of “forming a first recess in the first cladding layer” and “disposing a plurality of first deflector electrode assemblies in said first recess.” Independent claim 47 is similar, but specifies the use of a plurality of recesses. Nowhere does the Tabuchi patent describe or suggest placing deflector electrodes or electrode assemblies in a recess-like structures formed in a cladding layer.

Nothing in Tabuchi teaches or suggests placing deflector electrodes in recesses formed in a first cladding layer. First, Tabuchi is completely silent as to the use of deflecting elements which require electrodes to operate. The only electrodes structures disclosed in Tabuchi are contact pads used to connect external devices, such as lasers or photodiodes, onto the surface of a substrate. These electrodes are for a completely different purpose (*i.e.*, they are not “deflector electrodes”) and, in any event, they are not formed in a “cladding layer” as specified by the present claims. Those skilled in the art appreciate that a cladding layer is used to confine light in an optical waveguide. Thus, a cladding layer is not simply a substrate or any layer formed on a substrate. This usage is consistent with the discussion in Tabuchi, which uses the term “cladding layer” throughout only in reference to confinement structures in optical waveguides. In no instance does Tabuchi show an inventive embodiment with an electrode of any type formed in any type of recess in what the patent describes as a “cladding” layer. Thus, for example, none of the self-described cladding layers (generally numbered layers 267, 269) shown in FIGS. 53, 54, 55, 56, 57, 60, 61, 62, 64, 66, 70, 75, 77, 78, 80, 82, 83, 84, 87, or 90, have electrode of any type that are formed in a recess. (Note that layers 267B is referred to as a “buffer layer” not a cladding layer, and that the patent describes formation of a cladding layer 267H on the buffer layer. Likewise, the patent describes layer 277B as corresponding to buffer layer 267B. In any event, the patent does not describe electrodes of any type being present in a recess formed in these buffer layers.)

Both independent claims 1 and 47 also include the step of “forming microlenses *in the core layer* to produce an optical substrate assembly.” Nothing similar is shown or suggested by Tabuchi. The term core layer has a generally understood meaning in the art which connotes a waveguide structure wherein the core layer is used to transmit light. Tabuchi discloses placing separately-fabricated lens structures in openings formed on a non-optical substrate. Lenses are *not* “formed” “in the core layer,” and Tabuchi’s substrates are not used to transmit light. Rather, light is externally transmitted to the lenses that protrude above the substrate. Thus, for example, FIG. 26B shows a spherical lens 230 that has been placed in “pyramidal depression 131” formed in substrate 130, but with a major portion of the lenses extending above the substrate. Substrate 130 is made of silicon and does not play any role in optical transmission. This is clearly shown in FIG. 26B wherein light from laser 240 is depicted as traveling through the

atmosphere to lens 230, and thereafter. Thus, substrate 130 is not a "core layer" as required by the present claims.

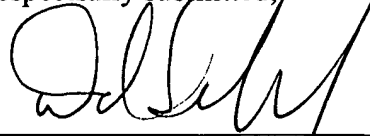
The Office Action appears to take bits and pieces from different figures of the Tabuchi patent out of context in an attempt to show the present invention. Thus, for example, the Office Action refers to "electrodes" 15, 16 and 22. However, "electrodes" 15, 16 and 22 only appear in the "prior art" drawings and are not shown or described as being in a recess or groove. There is no figure in Tabuchi which shows an electrode 15 or 22, or a bump 16 being present in a recess or groove 131 or 140. (It is further noted none of these structures are "deflector electrodes.") Likewise the examiner refers to "waveguide (33, 230, 260, 270)". However, there is no optical waveguide shown or described in the Tabuchi patent with the reference number 33. (The reference number 133 appears in the text but is not in any of the figures.) The reference number 230 is used to refer to spherical or cylindrical lenses, as shown, for example, in FIGS. 26, 30, 31, 32, 33, etc. The reference numbers 260 and 270 refer to passive optical waveguide branching structures. There are no electrodes associated with these passive waveguide structures, and none of "electrode" structures 15, 16 or 22 are shown in any of the figures which depict waveguides 260 or 270. Finally, the examiner refers to recesses and grooves "131 or 140". However, the reference number 140 refers to substrates and "subcarrier" substrates, as in FIG. 26. (These substrates are said to be made of silicon.) Reference number 131 refers to "depressions" that are etched in silicon. As noted above, in no instance is this used as a cladding layer, or is a deflector electrode formed therein.

Conclusion

In view of the foregoing amendments and remarks, Applicants submit that the case is now in condition for allowance and such action is earnestly solicited. The examiner is invited to telephone the undersigned at the below-listed number if doing so would advance the prosecution of the application.

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Respectfully submitted,

A handwritten signature in black ink, appearing to read 'D. Schnapf', written over a horizontal line.

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